

Collection of summaries of WAVE studies and research

(Fiscal 2001)

November 2002

Waterfront Vitalization and Environment Research Center

Major studies conducted by WAVE are described below.

I Studies and research projects concerning port policy, planning and information

(Studies on port policy)

Improvement of physical distribution efficiency

Study	Fiscal year when study was conducted	Study outline
Study on a plan for locating multi-purpose international terminals in the Tohoku area (Tohoku Regional Development Bureau)	2001	Bulk cargo transport through ports has recently been undergoing remarkable changes such as the concentration and refinement of production bases in the hinterland for increased production efficiency, concentration of more cargoes owing to cost reduction and use of larger transport vessels. In the meantime, lumbers or other goods have been transported more in containers than in bulk. In this study, future developments in bulk cargo handling in the Tohoku area were analyzed and plans for locating multi-purpose international terminals for handling bulk cargoes were examined. Problems were identified that would be involved in responding to the use of larger vessels, in increasing the efficiency of loading, in enhancing standards and quality, and in maintaining terminals. Then, a plan was proposed for locating multi-purpose international terminals in 15 major ports under the control of the Bureau.

<p>Study for forecasting demand for transshipment goods in Okinawa (Okinawa General Bureau)</p>	<p>2001</p>	<p>The East Asian area centering around Okinawa is expected to enjoy economic growth from a global viewpoint. Transport of goods for foreign trade mainly in containers is likely to increase substantially.</p> <p>Leading ports in Korea and Taiwan in the area have been expanding their operation seeking to transship container cargoes.</p> <p>To increase the transshipment in the area, it is badly required to develop a strategy unique to Okinawa based on a complete study of developments in domestic and overseas ports and future market trend.</p> <p>In this study conducted against the above background, verification was made of the validity of results of past cargo estimation conducted in Okinawa prefecture, and studies were made of institutions and conditions required for Naha Port to grow as an international distribution port. The possibility of handling transshipment cargoes and approach to project implementation were identified.</p>
<p>Study for collecting basic data for improving port facilities (Kyushu Regional Development Bureau)</p>	<p>2001</p>	<p>Developments in marine cargo transport were investigated in the Kanmon area of Kyushu to obtain basic data for developing long-term plans for improving port facilities in the area.</p> <p>The transport of (i) container cargoes for foreign trade, (ii) bulk cargoes and (iii) unit loads for domestic trade was identified from existing statistical data and analyzed. Members of leading businesses in the area were interviewed about the present and future of the handling of bulk cargoes and the use of port facilities. Based on the data collected, the future of marine cargo transport was examined taking the industrial and economic conditions in the area into consideration.</p>

<p>Study concerning the building of Kyushu port distribution network (Kyushu Regional Development Bureau)</p>	<p>2001</p>	<p>Handling of increased volumes of cargoes and faster distribution are required in marine cargo transport between the Kanmon area of Kyushu and Asia. Establishing trunk lines connecting respective regional blocks to Asia is therefore necessary rather than the concentration of cargoes in norther Kyushu as at present.</p> <p>In this study, the present distribution network was investigated and analyzed in the area, and a picture of distribution network as of 2010 was considered. A port selection model was developed to reflect the present volume of cargoes handled at each port. Based on the model, a picture of future physical distribution network was drawn on the assumption of multiple scenarios such as (i) transport of goods to norther Kyushu via inland feeder routes, (ii) establishment of a hub port for Asian trade in each regional block and (iii) building of a link among regional blocks via feeder routes.</p>
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<p>Study for examining measures for coordinating physical distribution infrastructure systems in the Hokuriku area (Hokuriku Regional Development Bureau)</p>	<p>2001 ~</p>	<p>A study was made of measures for coordinating port-based distribution infrastructure systems to increase the efficiency of distribution in the Hokuriku area and help improve the ports under the control of the Bureau based on an outline of new comprehensive physical distribution measures adopted at a cabinet meeting in July 2001 and on the basic policy developed by the Hokuriku area multimodal promotion forum.</p> <p>In order to drive regional development in the Hokuriku area in the sector of physical distribution as an action of the strategic forum for regional development in the area, a research committee was formed staffed with private and administrative members. In the study of this fiscal year, international physical distribution was selected as a theme. A picture of future international physical distribution using containers was drawn based on statistical and other data. Recommendations were made as to the methods of cooperation and coordination among stakeholders required for the enhancement of distribution service level and the increase of cargoes distributed in the Hokuriku area for the purposes of regional development and the improvement of international competitiveness of the area.</p>
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<p>Study on the effects of improvement of an international trunk channel in Ise Bay (Chubu Regional Development Bureau)</p>	<p>2001</p>	<p>The Irago-suido waterway at the mouth of Ise Bay is likely to be congested with vessels because more vessels of larger size are expected to navigate the waterway and consequently vessels may have to wait along the channel.</p> <p>Located in the hinterland of Ise Bay are the facilities of Japan's leading manufacturers including automobile makers. In the age of globalization, smooth overseas transport of goods needs to be ensured. The stagnation of traffic of container ships will lead to a great economic loss because containers are not transported according to a regular schedule as required.</p> <p>In this study, the influences that smaller ships using the waterway and marine phenomena would have on the ships navigating the Irago-suido waterway were identified by observing navigation conditions or referring to the records of entries into or departures from the port. Then, the cost of loss was calculated that would be incurred due to the stagnation of traffic of ships, and the effects of improvement of the Irago-suido waterway were evaluated.</p>
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Reorganization and new ways of use of waterfront area

Study	Fiscal year when study was conducted	Study outline
<p>Basic study concerning the improvement of waterfront disaster prevention facilities (Ports and Harbors Bureau)</p>	<p>1999 } 2000</p>	<p>When the Great Hanshin-Awaji Earthquake Disaster occurred in 1995, bulkheads that had been seismically reinforced and those that were restored early after the event played a great role in transporting emergency goods and evacuees. At the same time, waterfront green space and other open space were used effectively for building temporary housing, providing bases of restoration work, and temporarily storing or disposing of debris. The space made great contributions to the restoration and rehabilitation of public lives and socioeconomic activities. Then, the "basic policy for improving facilities to control great earthquake disasters" was developed, and a "manual on waterfront disaster prevention facilities" was prepared.</p> <p>In fiscal 2000, present conditions of seismically reinforced bulkheads, green space and other waterfront disaster prevention bases were investigated at 358 ports where seismically reinforced bulkheads were built or were planned to be built.</p> <p>In fiscal 2001, waterfront disaster prevention bases were assessed in respective ports based on the results of the study conducted in the previous fiscal year. Problems to be solved for accelerating improvement were identified. Seismic resistance of seismically reinforced bulkheads and roads in the hinterland was presented, and the ports were specified where open space or other waterfront disaster prevention bases had to be improved.</p>

<p>Study on industrial conditions in waterfront areas of Shikoku in relation to multi-purpose terminals (Shikoku Regional Development Bureau)</p>	<p>2001</p>	<p>This study focused on the review of functions that ports in the Shikoku area should perform as distribution hubs for goods transport with outside areas, considering the characteristics of the area. The objective of the study was to grasp the industrial and business conditions and future developments, management strategies, and the present and future physical distribution in and outside the area while transport infrastructure was developing with the completion of the Honshu-Shikoku Bridges and the refinement of the expressway network in the Shikoku area.</p> <p>Research forums were held attended by academic experts to discuss the roles that port should play for industries in the waterfront area based on the relationship between bulk cargoes, which account for a large percentage of goods handled at the ports in the area, and industries and future prospect of industries in the waterfront area. The effects of industrial development and port facilities improvement in the waterfront area on regional economic development and on the creation of employment were also evaluated.</p>
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<p>Study for building a transport network of used goods or waste centering around the port (Ports and Harbors Bureau)</p>	<p>1999 } 2001</p>	<p>In order to realize a resource recycling society to build a sustainable society and economy, developing an efficient system of transport of used materials and waste is important. Requirements include minimum cost, energy saving and small environmental loads. To meet the requirements, marine transport is considered superior to land transport.</p> <p>To transport used materials or waste, marine transport is considered more beneficial because waste is handled, because freight accounts for a high percentage of the cost and because neither fast nor regular transport is required. Little has, however, been known about the actual conditions of transport of used materials and waste.</p> <p>In the study conducted in fiscal 1999, problems involved in locating recycling industries in waterfront areas were identified and support measures were analyzed. In fiscal 2000, the possibility of modal shift to ships and the role of ports were organized.</p> <p>This study conducted in the third fiscal year was based on the position of ports specified in the eco-town project plans being implemented jointly by the Ministry of Economy, Trade and Industry and the Ministry of Environment and prefectural plans. Studies were made of the possibility of the use of marine transport, optimal port facilities and a network of transport of used materials and waste.</p>
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Efficient improvement, use and management of ports

Study	Fiscal year when study was conducted	Study outline
<p>Study concerning the future port management (Ports and Harbors Bureau)</p>	<p>2000 } 2001</p>	<p>In order for Japanese ports to serve physical distribution properly, various improvements are required not only in the construction of container wharves with great water depth currently underway but also in port management.</p> <p>In this study, a forum of intellectuals discussed how to improve port management. Regarded as immediate issues based on the recommendations of the Ports and Harbors Council were efficient operation of container wharves by the public sector and flexible setting or reduction of port charges. Recommendations were made as to the future port management systems.</p> <p>The concept of "public nature" was reviewed and port administrators and port development authorities were encouraged to take the initiative further.</p>
<p>Study concerning measures to promote coastal development projects for urban renewal (Ports and Harbors Bureau)</p>	<p>2001</p>	<p>Requirements have recently been increasing along the coasts of big cities for early repair of bulkheads or other facilities and provision of greater accessibility to water when the hinterland is redeveloped for housing or commercial activities. Using private finance initiative in such projects is expected to increase the effectiveness and efficiency of project implementation.</p> <p>In this study, therefore, a research forum composed of coastal administrators discussed methods for reducing public expenditure and the validity of use of PFI based on specific examples. A feasible project scheme was proposed to meet the requirements.</p>

Long-term vision and regional development

Study	Fiscal year when study was conducted	Study outline
<p>Study for locating container terminals and terminals for unit loads for domestic trade in the Tohoku area (Tohoku Regional Development Bureau)</p>	<p>2001</p>	<p>At present, 15 key ports are serving as hubs in international and domestic marine transport networks in the Tohoku area. Sendai-Shiogama Port, one of the ports, has been designated as an especially important port. More containers and unit loads have recently been handled at these ports owing to a substantial increase of efficiency of physical distribution. The transport of 80% of the international containers concentrated in the area, however, still depends on the ports in the Tokyo area. A plan for locating the ports under the control of the Bureau in the area as of 2010 was developed. As a result of this study, it was found that the rate of use of ports in the Tohoku area could be increased to 52% from a present level of 20% by using the trunk sea route mainly by Sendai-Shiogama Port and sharing the route to China by six ports under the control of the Bureau. Thus, the efficiency of physical distribution throughout the Tohoku area was expected to be increased.</p>

<p>Study for developing a vision for ports in Iwate prefecture (Iwate prefectural government)</p>	<p>2001</p>	<p>The Japanese government developed in December 2000 the "vision for ports in the new century" aimed at creating "ports link living, sea and world" as a basic goal of port policy for the new century.</p> <p>The goal of this study was to revitalize not only coastal but also inland industries by improving transport efficiency and reducing physical distribution costs according to the "vision for ports in Iwate prefecture". A basic direction of future port improvement policy was developed in relation to the method for future port improvement and the role of ports in the beginning of the 21st century.</p> <p>As a result of this study, it was found that sea routes should be attracted to the area and distribution efficiency should be improved to form physical distribution hubs, that infrastructure should be developed by the prefectural government to support regional self-help efforts for development to form regional revitalization hubs, that not only structural measures but also shelters and evacuation routes and methods should be studied to enhance disaster prevention capacity and that studies should also be made concerning environmental protection. The need of efficient and effective improvement of port facilities and of proper maintenance thereof was also identified as part of port administration.</p>
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<p>Basic study to create waterfront space for exchange in Shikoku (Shikoku Regional Development Bureau)</p>	<p>2001</p>	<p>The reorganization or creation of port space is now badly required as part of city planning to meet environmental, cultural, safety and security requirements.</p> <p>Port and Airport Department, Shikoku Regional Development Bureau, Ministry of Land, Infrastructure and Transport has specified as policy goals the "reorganization and creation of port space as a backbone of pleasant and rich regional life" and the "reinforcement of port functions to ensure safety, security and stability in life and on the sea". <i>Sunport Takamatsu</i> was opened in May 2001 in Shikoku. Waterfront space of hustling and bustling has been gathering public attention. A review has been made of port space throughout Shikoku.</p> <p>Against the above background, major ports on the mainland of Shikoku and ports on remote islands were reviewed as comfortable waterfront space for exchange based on the public needs and the opinions of outside intellectuals. Attention was paid to the creation of space of hustling and bustling and the accessibility to the shore.</p>
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<p>Study for improving services in daily lives on remote islands (Shikoku Regional Development Bureau)</p>	<p>2001</p>	<p>There are numerous small islands in the Seto Inland Sea. People frequently visit the mainland of Shikoku to see a doctor or do shopping. The population on the islands is also rapidly growing old.</p> <p>The Barrier-Free Transportation Law went into effect in Japan in November 2000 to increase the convenience and safety of the elderly and physically impaired who use public transit systems.</p> <p>In this study, questionnaires were distributed to port administrators and residents on remote islands, and discussions were held at meetings of academic experts. Problems involved in marine transport were identified from a viewpoint of barrier-free transport. Specific measures were reviewed for making ports barrier-free as transport hubs and for supporting life-related services in the fields of medication and welfare.</p>
<p>Study on the action plans for realizing the vision for ports in the new century (Kanto Regional Development Bureau)</p>	<p>2001 ~</p>	<p>In this study conducted based on the "follow-up on the basic port development plan in Tokyo Bay" carried out in fiscal 2000, more basic data were collected and organized, and measures were further examined. A "basic plan for ports in the Tokyo metropolitan area" was developed in March 2002 from new viewpoints including urban renewal.</p> <p>In order to develop action plans to implement the "basic plan for ports in the Tokyo metropolitan area", examples of advanced applications were sought throughout the country and the effects of plan implementation and problems to be involved were identified. Indicators of outcomes of port improvement were presented to the public in a plain format.</p>

Planning and investigation projects
 Building of physical distribution infrastructure

Study	Fiscal year when study was conducted	Study outline
<p>Study on the effects of construction of an international container terminal with a great water depth at Nagoya Port (Nagoya Port and Airport Construction Office)</p>	<p>2001</p>	<p>The volume of containers for foreign trade has been exceeding the capacity of the existing container terminal at Nagoya Port. Constructing a new container terminal with a great water depth is therefore required. To meet the requirement, the need of a new container terminal was assessed.</p> <p>As a result, it was found that Nagoya Port should be selected by freighters as a port of call, facilities should be constructed to accommodate large container ships and wharves with a wide yard should be immediately prepared to contribute to industrial activities in the hinterland. Water depth and wharf length should be adequate to accommodate ships of ever increasing size. It was also revealed that the coordination with the organizations concerned and the building of a loading system are required for efficient and effective port management.</p>

<p>Basic study for improving Onahama Port and study on goods transport through Onahama Port (Director-General of Onahama Port Construction Office and Utilization and Promotion Council for Onahama Port)</p>	<p>2001</p>	<p>In this study, the present conditions of container handling in and around Onahama Port were identified and the possibility and measures for increasing overseas container transport through Onahama Port were examined.</p> <p>In the study, examination was made of the possibility of freighters shifting container transport from Tokyo and Yokohama Ports to Onahama Port based on the results of questionnaires completed by the freighters in the hinterland of Onahama Port, interview results and statistical data, and in view of the characteristics of container cargoes. The shipping routes requiring greater efforts were identified, and considerations were given to the coordination with other ports for increasing the cargoes to be handled, invitation of shipping operators and appropriate port sales measures. The problems involved in land transport of containers were also investigated.</p> <p>Based on the above results, the volume of containers to be handled at Onahama Port was estimated for each shipping route. Then, proposals were prepared for future requirements for port facilities, roads and port sales.</p> <p>This study was conducted jointly by the Onahama Port Construction Office of the Tohoku Regional Development Bureau and the use promotion council of Onahama Port, Fukushima Prefecture.</p>
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<p>Study on physical distribution management in Nakagusukuwan Port (new port area) (Okinawa prefectural government)</p>	<p>2001 ~</p>	<p>Nakagusukuwan Port is a key port located on the east coast of the mid-south section of the main island of Okinawa. The new port area is in the north of Nakagusuku Bay. The port is being improved in three phases as a distribution and processing port contributing to distribution and production. The first-phase work has been completed. Work is underway in the second phase. The site of the third-phase construction has been designated as a "special free trade area". Under the circumstances, reinforcing port functions is essential to the enhancement of transport efficiency of existing businesses and to the promotion of business entry into the industrial sites currently being sold.</p> <p>In this study, which was aimed at meeting the above requirements, the role that the new port area should play was specified through the analysis of present conditions, and major distribution management measures were discussed in a committee. Then, measures were determined to build a cargo transport system, attract routes for liners and efficiently manage the port, and action plans were developed and proposed.</p>
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Creation of comprehensive port space

Study	Fiscal year when study was conducted	Study outline
<p>Study to drive the reorganization of Kitakyushu Port Sunatsu area (Kitakyushu municipal government and the landowners concerned)</p>	<p>2000 } 2001</p>	<p>In the Kitakyushu Port Sunatsu area, located adjacent to JR Kokura station at the center of Kitakyushu City, a wide area of land has been left idle with the closure or relocation of plants and the facilities of Japan Freight Railway Company. It is necessary to use the idle land to develop waterfront and urban sections in a unit. In order to build an excellent port space open to the public in the area, a Sunatsu area redevelopment plan was roughly examined in fiscal 2000.</p> <p>In this study, conducted based on the results of the fiscal 2000 study, the feasibility study was continued. The type of marine traffic that the Sunatsu area should carry was identified. Some development plans were proposed that were considered promising in the area for land or water use. The size and location of the marine transport hub were used as parameters. Project costs and implementation methods were also reviewed.</p>

Long-term plans and development measures

Study	Fiscal year when study was conducted	Study outline
Study for preparing a basic Oiso Port redevelopment plan (Government of Oiso-machi)	2001	<p>At present, Oiso Port is used as a base for landing aggregate or discharging fish or as parking space for tourists who visit from surrounding areas for bathing during summer.</p> <p>Relaxed way of life has recently been considered important. Ports are also required to provide a place of relaxation to the public. It is time to reconsider the role of Oiso Port.</p> <p>In this study, a committee composed of intellectuals, and representatives of local communities and businesses concerned held meetings four times. A basic port redevelopment plan was prepared to revitalize Oiso Port for future development of the town using the regional characteristics of the port. The goal was to pay attention to local requirements and to construct an "open port" friendly to tourists as well as to residents. Considerations were given to functions, landscape and environmental education.</p>
Study for Naha Port improvement (Director-General of Naha Port and Airport Construction Office)	2001	<p>Naha Port, a gateway to Okinawa prefecture, has been playing an important role as a hub of transport to the ports of the mainland of Japan and those in the prefecture, and as an international port of trade. The port has been improved to handle increasing cargoes and containers and meet the need of industries located in the port area. Work is underway in the Urasoe area.</p> <p>In this study, the present distribution conditions were identified to understand how cargoes originating in the port are related to the industries in Okinawa prefecture. The role that Naha Port should play and how to improve the port for economic development of the prefecture were reviewed. Basic data were collected for improving the Urasoe area.</p>

<p>Study on Kochi Port Harbor Refresh 21 (Director-General of Kochi Port and Airport Construction Office and Kochi prefectural government)</p>	<p>2001 ~</p>	<p>At Kochi Port, a hub of exchange will be created to contribute to the revitalization of exchange and the progress of international exchange by constructing a new port.</p> <p>In the inner port, waterfront reorganization combined with city planning is an important issue. In this study, port improvement plans were prepared for three areas (Shioe, Kokadai and Misato) according to the policies shown in the long-term Kochi Port development plan and the port improvement plan.</p> <p>The Shioe area will be developed as a space for gathering and pleasure, the Kokadai area as a space for food and the Misato area as a space for cultural exchange and field training. The three areas will have mutual exchanges. The functions to be performed by respective areas were reviewed, and a framework for locating these areas was presented.</p> <p>Citizen meetings were held and public opinions were collected via the Internet. Local committees organized in the three areas had discussions. Then, a review panel composed of academic experts compiled various opinions and made further discussions.</p>
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<p>Study on Shimizu Port improvement plan (Director-General of Nakashimizu Port Construction Office)</p>	<p>2001</p>	<p>As the port improvement plan was scheduled to be revised in 2003, check was made of land use and port-side roads for container terminals in the Shin-Okitsu and Orido areas, possibility of modal shift in marine container transport to trains, project for constructing a man-made beach in the Shin-Okitsu area and construction of lumber wharf and lumber yard in the Orido area.</p> <p>As a result, the functions to be performed by the container terminals, direction of management and operation, facilities location plans, land use plans and inter-wharf road construction plans as of 2003, 2008 and 2013 were presented. In relation to the possibility of modal shift in marine container transport to trains, such conditions as project costs and train service schedule were identified. The man-made beach was found to be sufficiently effective as a result of a review of facilities construction plans and cost-benefit analysis. The functions that the Orido and Sodeshi areas should perform were evaluated based on an estimate of lumber import. Land and water use plans were presented for the Orido area.</p>
<p>Study on port and city planning in Fushiki-Toyama Port (Toyama area) (Toyama municipal government)</p>	<p>2000 } 2001</p>	<p>Directions of use in outer and inner port zones were defined in the "study for project implementation in Fushiki-Toyama Port (Toyama area)" conducted in last fiscal year jointly by Toyama municipal and prefectural governments and the office under the direct jurisdiction of the ministry concerned. In this fiscal year, meetings were held between local residents and port administrators to discuss port and city planning. Requirements for each zone were determined for improving the outer port of Toyama Port based on the opinions aired at committee meetings, the relationship with surrounding facilities and the activities of regional industries.</p>

<p>Preparation of a basic plan for improving Ito Port and the coastal area (Ito municipal government)</p>	<p>2000 } 2001</p>	<p>At Ito Port, the development of a coastal area attractive to the residents and tourists is required.</p> <p>As part of this study, based on the results of fiscal 2000 study, details and procedure of improvement were discussed at the "research forum for the improvement of Ito Port and the coastal area" composed of port administrators and users. Specific improvement methods and schedule were organized. Then, an improvement plan was prepared that is compatible with the development of Ito City.</p>
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Other

Study	Fiscal year when study was conducted	Study outline
<p>Study to evaluate project achievement (Okinawa General Bureau)</p>	<p>2001</p>	<p>Ports of Okinawa have been improved steadily according to a three-phase development plan since the reversion of Okinawa to Japanese administration. In this study, a 30-year history of Naha, Hirara and Ishigaki Ports and the hinterland after the reversion was organized, and the economic effects of these ports on regional society were identified. As a result, past port improvement proved effective.</p> <p>In this study, the effects of project implementation and use of ports and their ripple effects were assessed to understand the effects that ports had on regional economies. The effects of improving the port as a whole and those of installing specific facilities were assessed separately. The effects were also classified into such categories as physical distribution, safety, life and city planning, tourism and amenity, industrial development and employment creation, and environmental protection. Basic data were presented to the public in a plain format based on the results of interviews with those concerned with the port and on the statistical data.</p>
<p>Study for driving the improvement of Sakai Port (Sakai Port and Airport Construction Office)</p>	<p>2001</p>	<p>A forum was held as an event commemorating the 50th anniversary of designation as an important port. Opinions and comments at the keynote speech and panel discussions were recorded. Based on the opinions, a report was prepared to help improve Sakai Port.</p>

<p>Basic study on port-side traffic in Akita Port (Akita Port and Airport Construction Office)</p>	<p>2001</p>	<p>The structure and method were examined for the connecting road to be built at the mouth of Akita Port in the studies conducted in previous years and at review committee meetings. As a result, an immersed tube tunnel was recommended.</p> <p>The basic conditions for planning were, however, changed because of revisions of plans for land use in the surrounding area due to recent changes in economic conditions and because of deteriorating public finance. Another study was therefore required on a wide-area road network around Akita Port with or without the connecting road.</p> <p>In this study, problems involved in the construction of the connecting road and the effects of multiple options were assessed. Then, constructing a connecting road at the mouth of the port was found to be most effective. Questionnaire forms were sent to vehicle users in the local households and businesses around Akita Port to collect comments on the present problems and the construction of a connecting road at the mouth of the port. As a result, it was found that users were worried about the traffic on the port-side bypass and well aware of the port-side connecting road construction plan.</p>
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<p>Development of virtual reality systems (Naha Port and Hirara Port) (Naha Port and Airport Construction Office and Hirara Port Construction Office)</p>	<p>2001</p>	<p>Basic data were collected for examining the facilities to be constructed during the improvement of Naha and Hirara Ports, and for assessing the influences on the surrounding environment, using virtual reality systems. Application programs and multimedia contents were developed for using the data in the review of landscaping. The three-dimensional data and application programs are collectively referred to as virtual reality systems here. The systems enable the user to surf in the virtual space to simulate the details of facilities development plans.</p> <p>For Naha Port, basic data were generally collected on the Naha, Tomari, Shinko and Urasoe wharf areas. Detailed data were collected on the area surrounding the planned immersed tube tunnel at the Naha wharf.</p> <p>For Hirara Port, basic data were collected on the Harimizu, Shimosaki and Turibah areas. Multimedia contents were also produced for presenting port development plans including a virtual reality tour. The multimedia contents can be used for multiple purposes including public relations for future port development plans.</p>
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Digitization research projects
Port EDI

Study	Fiscal year when study was conducted	Study outline
Study to evaluate project achievement (Okinawa General Bureau)	2001	<p>Ports of Okinawa have been improved steadily according to a three-phase development plan since the reversion of Okinawa to Japanese administration. In this study, a 30-year history of Naha, Hirara and Ishigaki Ports and the hinterland after the reversion was organized, and the economic effects of these ports on regional society were identified. As a result, past port improvement proved effective.</p> <p>In this study, the effects of project implementation and use of ports and their ripple effects were assessed to understand the effects that ports had on regional economies. The effects of improving the port as a whole and those of installing specific facilities were assessed separately. The effects were also classified into such categories as physical distribution, safety, life and city planning, tourism and amenity, industrial development and employment creation, and environmental protection. Basic data were presented to the public in a plain format based on the results of interviews with those concerned with the port and on the statistical data.</p>
Study for driving the improvement of Sakai Port (Sakai Port and Airport Construction Office)	2001	<p>A forum was held as an event commemorating the 50th anniversary of designation as an important port. Opinions and comments at the keynote speech and panel discussions were recorded. Based on the opinions, a report was prepared to help improve Sakai Port.</p>

Study	Fiscal year when study was conducted	Study outline
<p>Operation, management and development of a system for using EDI for submitting application forms to the port commander and port administrator (Keihin Port Construction Office and Maritime Safety Agency)</p>	<p>2001</p>	<p>The port EDI system has been operated on a trial basis since October 1999. The system was used for operation management, user management and notification in fiscal 2001 as in the past. A system working in coordination with Sea-NACCS was developed in fiscal 2000, and comprehensive system tests were started in October in fiscal 2001. The operation of the system was commenced in January in fiscal 2002. Then, it became possible for the user to use a Sea-NACCS terminal designed for application at customs office to send application forms to the port commander and port administrator using the port EDI system.</p> <p>A security communications system to ensure a high level of security, a statistical system for transferring cargo information in Sea-NACCS to the port administrator, and a system for inspecting the designation of anchorage were developed. Port EDI system revision and other measures were checked to prepare for the installation of AIS (Automatic Identification System) based on the International Convention for Safety of Life at Sea (SOLAS Convention).</p>

<p>Study to examine the methods for developing a one-stop-service system for port-related procedures (Ports and Harbors Bureau)</p>	<p>2001 ~</p>	<p>Enhancing the service level is important for international ports to increase their competitiveness in the global market. Entries of ships to the port and the transport of cargoes involve various procedures at multiple administrative agencies, placing burdens on the user.</p> <p>IMO (International Maritime Organization), one of the United Nations organizations dedicated to the handling of maritime problems, has prepared the "Convention on Facilitation of International Maritime Traffic (FAL)" that defines the procedures for entries into and departure from the port and berthing ships at the port for international vessels to facilitate international maritime transport. Now it is necessary to review actions required if the convention is to be applied to Japan.</p> <p>To realize an electronic government, it is urgently required to implement a one-stop-service system handling various port-related procedures. The one-stop-service system enables the user to file applications at multiple administrative agencies by inputting necessary data only once. To that end, port-related procedures will be digitized, the procedures will be simplified to reduce burdens on the user and the administrative agencies concerned will share information and handle similar processing at a time.</p> <p>In this study, grand design and action programs were evaluated for developing a one-stop-service system.</p>
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Port information

Study	Fiscal year when study was conducted	Study outline
<p>Study concerning the verification test of an intermodal distribution information platform (Ports and Harbors Bureau)</p>	<p>2001</p>	<p>In marine container transport, a variety of physical distribution information is handled at different phases of transport by ship (maritime transport) and truck (land transport) and at a terminal (sea-land interface). Information was not exchanged smoothly in the past because no systems were available to serve the purpose. An intermodal distribution information platform was therefore developed to provide for the sharing of distribution information. The effects of system implementation were evaluated in a verification test. The verification test was conducted at Hakata Port where efforts are being made to share information using HiTS developed and implemented on its own. Additional functions were provided that reflected the opinions of stakeholders.</p> <p>In the verification test, the effects of system development were evaluated in terms of the (i) efficiency for each player, (ii) time required for container transport and (iii) whether traffic congestion around the terminal was mitigated or not.</p>

II Studies and research on port environment and environmental ISO

Basic research projects

Research on the environment, environmental creation measures and planning methods

Study	Fiscal year when study was conducted	Study outline
<p>Study on the environmental impact assessment and public involvement procedure in the phase of port development plan preparation (Ports and Harbors Bureau)</p>	<p>2001</p>	<p>The Ministry of Land, Infrastructure and Transport has been studying public involvement in public utilities projects.</p> <p>In this study, examples of advanced overseas port development plans and road and river projects in Japan were collected and analyzed. A review was made of environmental impact assessment based on public involvement, in the port development plan preparation phase.</p>
<p>Preparation of materials for presenting eco-port projects (Tohoku Regional Development Bureau and Kanto Regional Development Bureau)</p>	<p>2001</p>	<p>The Ministry of Land, Infrastructure and Transport has been conducting lectures in the field to increase administrative transparency and promote administration based on the face-to-face communication with the public. The objectives are to have the public understand the projects and policy of the Ministry and to reflect public opinions and requirements in administration.</p> <p>Examples of project implementation, materials and photographs were collected in relation to various eco-port projects and coastal improvement projects that were being implemented under the control of the Tohoku and Kanto Regional Development Bureaus. Documents were prepared using PowerPoint to present the objectives, details and effects of projects in a plain format.</p>

<p>Study on the environmental impact assessment for ocean disposal of dredged material (Voluntary research)</p>	<p>2001</p>	<p>Establishing global standards is required for ratifying London Protocol 1996 to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention).</p> <p>In this study, a committee composed of environmental and port experts discussed the present conditions and problems for Japan in relation to the requirements of London Protocol 1996 focusing on bottom sediment evaluation systems, test methods, criteria, disposal sites in sea areas and monitoring.</p>
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Research on environmental creation technology

Study	Fiscal year when study was conducted	Study outline
<p>Study on the functions of a negative pressure seawater exchange device (Sendai Research and Engineering Office for Port and Airport)</p>	2001	<p>A comprehensive review was made of a negative pressure seawater exchange device. Technological development has been underway to increase water quality through seawater circulation by lifting bottom seawater using the tidal energy in a closed sea area. In order to make an effective use of the device in the future, the influences and effects of lifted bottom water on surrounding sea areas and monitoring methods were evaluated, and the effectiveness of the device for improving water quality was presented.</p>
<p>Study on a coastal ecosystem testing facility (Port and Airport Research Institute)</p>	2001	<p>Preliminary designs were made for test tanks, water-supply and wastewater plumbing, facilities in the vicinity and test buildings at the coastal ecosystem testing facility that the Port and Airport Research Institute plans to build. The specifications and quantity of mesocosm tanks were determined. How to adjust temperature and DO (dissolved oxygen) concentration, wave generating and lighting equipment, and water-supply and wastewater plumbing were checked. The location of the testing facility was reviewed, and the layout and architectural structure of the test building were determined. Construction schedule was prepared and rough cost estimate was made. Alternatives were assessed several times to meet the requirements for construction period and cost. In the end, the final specifications were determined for the testing facility.</p>

Studies and research on the building of resource recycling society

Study	Fiscal year when study was conducted	Study outline
<p>Study to check methods for repairing waste disposal bulkheads (Nagoya Research and Engineering Office for Port and Airport)</p>	2001	<p>In this study, the stability of geomembrane as a means of controlling seepage in waste disposal bulkheads, and of covering material was checked in a model test and by numerical calculation. Design methods were also evaluated.</p> <p>In the hydraulic model test, the wave acting on the front face of the bulkhead and the water pressure on the geomembrane installed in the backfill of bulkhead were measured. The acting wave pressure was evaluated in a numerical analysis. Based on the results of the hydraulic model test and numerical analysis, a design method was proposed for calculating the water pressure acting on the geomembrane based on the wave acting on the front face, tide level and the type of bulkhead structure. In the model test, the stability of covering material when external forces acted on the geomembrane was verified. Then, a covering material design method was proposed.</p>
<p>Study on the ports in resource recycling society (Tohoku Regional Development Bureau)</p>	2001	<p>How ports are used for the distribution of industrial waste and recycled materials in the Tohoku area was identified. The future of transport of used materials and waste and recycling facilities at ports was examined.</p> <p>The present methods of collecting or disposing of waste and the means of transport in the Tohoku area were organized based on statistical data. The use of ports for disposal in particular was grasped. Plans for serving as a hub of comprehensive transport of used materials and waste were organized in Sakata, Hachinohe, Kamaishi and Ofunato Ports. Then, a future recycling network in the Tohoku area was proposed.</p>

<p>Study on the transport of used materials and waste in the Seto Inland Sea (Chugoku Regional Development Bureau)</p>	<p>2001</p>	<p>The Ports and Harbors Bureau of the Ministry of Land, Infrastructure and Transport has been "building a comprehensive system of transport of used materials and waste using ports as a core". In Ube Port, the port improvement plan to serve as a hub of transport of used materials and waste was scheduled to be revised in March 2002. The port had been designated as a site of "eco-town project". Then, a recycling support plan was developed for waste plastic transport through Ube Port. The port was also used as a model for studying a plan for transport of used materials and waste through ports along the coast of the Seto Inland Sea in the Chugoku area.</p> <p>Problems involved in providing recycling support in Ube Port were presented. The problems included the difficulty in flexibly transporting materials because of varying volume of cargoes assembled, need to identify the legal restrictions for authorizing transshipment or storage, need to make arrangements among those concerned for use of public wharves and need of coordination with eco-town projects being implemented by the Ube municipal government.</p>
<p>Basic study concerning no-garbage resource recycling technology (National Institute for Land and Infrastructure Management)</p>	<p>2001</p>	<p>As a basis for conducting research on no-garbage resource recycling technology effectively and efficiently, materials on present technologies in wide areas such as the control of waste production used material transport systems and waste disposal sites were collected and analyzed. Problems involved in technical development were extracted.</p>

Applied research projects
 Studies on port environmental planning

Study	Fiscal year when study was conducted	Study outline
Study on environmental creation in the Tokyo Bay waterfront area (Kanto Regional Development Bureau)	2001	<p>The objective of this study was to study long- and short-term measures for creating and improving the environment in the sea area throughout Tokyo Bay. Specific environmental creation measures and problems involved in project implementation were presented.</p> <p>At review meetings attended by academic experts, administrative staff and NPO (non-profit organizations) members, public opinions and requests were organized as a step toward the preparation of action plans.</p> <p>The people who attended the meetings provided various opinions and requests concerning the conceptual viewpoint, improvement plans, facilities management methods, operation methods, participation in monitoring and coordination. Port environment creation measures recommended by port administrators in the planning and design phases and the idea of new environmental creation project plans were extracted. An outline of improvement and problems involved in implementation were organized. It is hoped that the issues raised will be discussed further by presenting case studies.</p>

<p>Study to improve the environment in the Sea of Ariake (mud controlling measures) (Kyushu Regional Development Bureau)</p>	<p>2001</p>	<p>This study was related to the environmental problems in the Sea of Ariake such as red tide and poor-oxygen water, poor laver harvest and deaths of shellfish. Causes of the deposition of floating mud, an environmental feature in the Sea of Ariake, were identified. Check was made of the influences of floating mud on water, bottom environment and aquatic species, and of the problems involved in improving the environment.</p> <p>Studies were made of the (i) information on the ocean environment, (ii) deposition of floating mud and deposition mechanism and the causes, (iii) influences of floating mud on the ocean environment and (iv) future improvement measures and problems involved.</p>
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Study on plans for creating ocean environment

Study	Fiscal year when study was conducted	Study outline
<p>Study on methods for assessing the environmental impact of offshore airport (Kanto Regional Development Bureau)</p>	<p>2001</p>	<p>Methods for assessing the environmental impact of the construction of an offshore airport in Tokyo Bay were identified and a proposal was made.</p> <p>Studies were made of the (i) methods for assessing the impact on the ocean environment (investigation, prediction and evaluation methods and field investigation plans), (ii) verification of environmental impact assessment methods (methods for checking the flow regime in the sea area, seabed geology and the impact of river overflow), (iii) identification of the characteristics of the Tama River area (regional characteristics and changes in river environment), (iv) an environmental data retention system (basic design and the development of a data retention system) and (v) environmental protection measures.</p>

Study on port landscape and green base creation plans

Study	Fiscal year when study was conducted	Study outline
Study for creating a green base in the waterfront area of Osaka Bay (Kinki Regional Development Bureau)	2001	<p>The Sakai and Amagasaki waterfront areas of Osaka Bay have been designated as the sites of "green bases in waterfront areas" in a third-phase urban renewal project. In this study, the coordination between the green space in a port and that on land, and public involvement in the development of green space in a port were examined.</p> <p>In the study on the coordination between the green space in a port and that on land, it was considered necessary to restore a lost natural environment, create a place for recreation and exchange for the public and develop new types of industries. It was also found necessary for the public to participate in green space development in the port by working in combination in a network rather than by playing separate roles as in the past. Flexible public involvement from the planning phase was suggested.</p>

Research on and promotion of environmental ISO certification

Study	Fiscal year when study was conducted	Study outline
<p>Study concerning the building of an environmental management system (Kansai International Airport Land Development Co., Ltd.)</p>	<p>2000 } 2001</p>	<p>In the second-phase Kansai International Airport construction project, construction management is badly required that is in coordination with the local community and takes the protection of living and natural environments in Osaka Bay and surrounding areas into consideration. It is essential to minimize the environmental impact in Osaka Bay and surrounding areas by ensuring environmental monitoring and taking environmental measures as actively as possible in each step of the second-phase construction.</p> <p>Kansai International Airport Land Development Co., Ltd. obtained ISO14001 certification for environmental management systems in December 1999 and has been operating the systems effectively in cooperation with businesses participating in the second-phase construction to prevent environmental pollution.</p>